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NATURAL HISTORY MUSEUM OF
LOS ANGELES COUNTY

WORMS PAST AND PRESENT

In Act 2, Scene 1, of Shakespeare's *The Tempest,* Antonio says to Sebastian, "What's past is prologue." This observation certainly applies to the history of life on earth. Our understanding of the incredible diversity of species and their adaptations would be vastly incomplete if we did not take into consideration evidence available in the fossil record. And our interpretation of the past is usually molded by our knowledge of life today. It is this intimate relationship between past and present that natural history museums seek to elucidate.

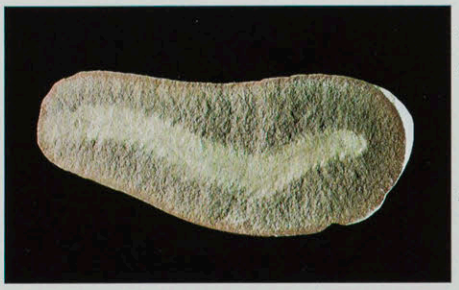
The fossil record is of course very selective, often giving us glimpses of only those species capable of leaving behind hard body parts, such as shells or skeletons. As a result, the known diversity of extinct species is but a fraction of the actual diversity. This limitation on the window into the past can be especially frustrating for marine invertebrate zoologists like myself who study small or soft-bodied creatures that rarely survive as fossils.

There are, however, several localities with spectacularly well-preserved fossils of soft-bodied invertebrates that lived on the ocean bottom. Australia has the Ediacaran fauna of 600 million years ago, and 550-million-year-old invertebrates are known from the Cambrian-age Burgess shale in British Columbia and from similar sites in China. These regions offer the opportunity to understand the evolution of life in the seas.

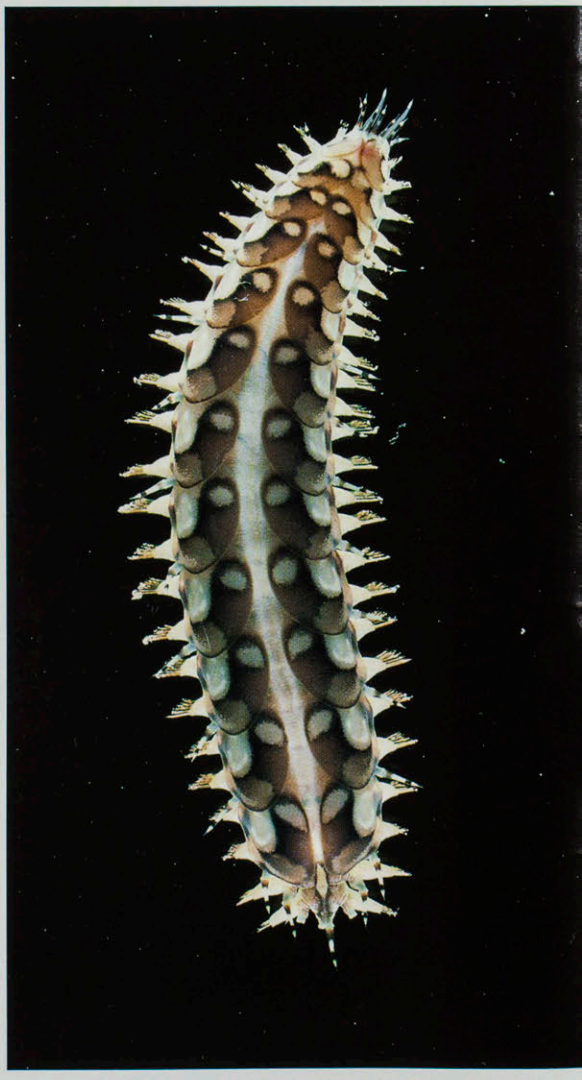
Among the most ecologically important invertebrates found on the sea floor today are the Polychaeta, or segmented sea worms, one of two classes in the phylum Annelida (the other annelid class, the Clitellata, includes the earthworms and leeches). In addition to having antennae and filaments called cirri on their heads, most polychaetes have paired lobelike appendages, the parapodia, along the sides of each of their body segments. Extending from each parapodium are two bundles of elongate bristles called setae—the name *polychaete* is in fact derived from Greek words meaning "many bristles." The setae and parapodia function like little oars, allowing the worms to crawl over the surface or burrow into mud.

Polychaetes are vital components of the marine food chain. With more than 80 families and 10,000 described species, these sea worms display an amazing array of body forms and feeding strategies, which have allowed them to exploit every type of marine habitat at every depth in

2-INCH LONG FOSSIL: DICK MEIER



½-INCH LONG FOSSIL: DICK MEIER



KATHIE ATKINSON

***Right: Lepidonotus melanogrammus,* a ½-inch long polychaete of the group known as scaleworms, for the rows of paired circular plates along the back of their bodies. The scales are actually not armorlike but instead are soft and easily dislodged when the worms are captured and preserved; the advantage of the structures is not known.**

***Above: Fastuoscolex gemmatus (left),* and *Dryptoscolex matthiesae,* 280 million year old fossil scaleworms from the Mazon Creek site in northeastern Illinois. The parapodia along the sides of *F. gemmatus* are quite distinct; the dark region down the middle of the body might be remnants of the gut. During fossilization of *D. matthiesae,* the body became very compressed, exposing the four small jaws attached to the gut; they are seen here as small black dots just below the top of the head, which is at the right.**

Cover: The iridescent *Marphysa sanguinea,* which is about 6 inches long, exhibits the sensory head appendages and multisegmented body that are typical of the otherwise very diverse group of marine worms known as the polychaetes.

the oceans. In nearly all of the bottom habitats in which they occur, they are the most abundant invertebrates. Because of this abundance and diversity, the environmental quality of almost any region on the sea floor can be readily assessed by identifying the polychaete species that are present or absent.

ALTHOUGH the fossil record for polychaetes and other soft-bodied marine organisms is not very extensive, the polychaete fossils that are available provide an intriguing story about the evolution of the group. A famous trove of fossilized soft-bodied marine invertebrates in the United States is Mazon Creek in northeastern Illinois. The Mazon Creek fauna lived in a shallow tropical bay during the Pennsylvanian Period, over 280 million years ago. Along the coastline were several river deltas, which frequently deposited fine silt and mud into the bay; the result of this periodic runoff of sediments was the occasional rapid burial of the bay's bottom fauna, including its polychaetes. In the absence of oxygen, the decomposition of the buried animals was very slow, facilitating superb preservation of their soft anatomy.

What is especially intriguing about the Mazon Creek polychaete fauna is that all of its ancient species can be assigned to families currently in existence. Details of head appendages, parapodia, and setae are all evident. Morphologically, Mazon Creek polychaetes are almost identical to creatures present in today's oceans. Given this level of similarity, we can easily ascertain how they lived.

At least eleven families are represented among the fourteen described Mazon Creek species, nearly all of which are carnivores that probably lived on the surface of the mud. As with many of today's carnivorous species, most of the Mazon Creek polychaetes had paired jaws that could be protruded out of the mouth to capture prey. In addition to the active little predators, there were at least two species that were more sedentary. One of these, a "feather-duster worm," would have used its cirri to filter food particles from the surrounding water. Another species probably lived in a burrow, using its head appendages to collect and consume organic materials in muds near the burrow entrance.

Burrowing polychaetes, which are

KATHIE ATKINSON

Top *(left)* and bottom views of *Ceratonereis limnetica*, which is like many other carnivorous polychaetes in having paired "jaws," like tiny ice tongs, attached near the head end of its intestinal tract. To feed, the worm quickly everts that portion of the gut out of its mouth *(right)*, grabs a victim with the jaws, and then pulls the gut and prey back into its body.

KATHIE ATKINSON

***Diopatra dentata*, a 1 1/2-inch-long predatory species, pokes its head out from a tube it has constructed; it uses the well-developed and muscular little parapodia along the sides of its body almost like hands in pressing sand grains into place to make its shelter.**

very common in present marine environments, are rare in the Mazon Creek fossil collections. It could be that burrowers were simply not abundant at Mazon Creek. But it is more likely that the burrowers there were small and thus not as readily fossilized (most of the Mazon Creek polychaetes are big—several centimeters long on the average; in contrast, few burrowing polychaetes reach a length of 1 centimeter).

Recent studies of polychaetes indicate that all the carnivorous families present in the Mazon Creek fauna were evolutionarily advanced in body form. In other words, by the time the Mazon Creek fauna came on the scene, polychaete families were quite diverse, on par with what we see today, and had probably been so back at least to the Cambrian Period at the beginning of the Paleozoic, some 600 million years ago. Paleontologists are fond of referring to this time as the Cambrian Explosion, in reference to the morphologically diverse groups of organisms that were first deposited in the fossil record then. But even the oldest of polychaete fossils appear to represent descendants of evolutionary diversification that occurred long before the Paleozoic Era. Fossil polychaetes suggest that the "explosion" began much earlier in the seas.

KIRK FITZHUGH

Dr. Fitzhugh, Associate Curator of Invertebrates, first encountered polychaetes—in particular, the fan worms—at the age of 17 while he was working with marine aquaria in a pet shop. His fascination with marine biology continued in his studies at Texas A&M University, where he was introduced to the diversity of polychaetes along the Gulf coast.

Kathie Atkinson, who photographed the living polychaetes shown here, is a freelance wildlife photographer based in Australia. She is author of a number of books for children, including Life in a Rotten Log *(Allen & Unwin, 1993), which has received several awards.*

KATHIE ATKINSON

A yet to be identified species of the family Amphinomidae, a group commonly known as the fireworms. The dense bundles of glasslike bristles along the sides of the body produce the "fire": they are easily broken off when the worm is handled and can cause a painful inflammation if they become lodged beneath the skin of an unwary human swimmer attracted to these lively and colorful 1- to 5-inch long polychaetes.

The 5-inch-long polychaete *Australonereis ehlersi* extends up out of its sand grain tube in a search for food. Its prominent head antennae and the well-developed parapodia along its body allow it to move about quickly in the hunt for other small invertebrate prey.

KATHIE ATKINSON

BARBIE, TEDDY, AND JACK

Classics from the Toy Loan Program Collection

Toys tell the story of civilization in miniature, since practically every major scientific discovery, every important historic event, and every whim of fancy in the world of fashion is chronicled in the realm of toys.—Dan Foley, *Toys Through the Ages*

TOYS OF COURSE ARE NOT SIMPLY wonderful playthings. In all cultures and periods, they have been designed to instruct as well as delight, to reinforce lessons, gender roles, mores, and manners.

Some of the cultural messengers, such as the Barbie® doll, Teddy bear, and jack-in-the-box, have been beloved for generations, while others like the Cabbage Patch Doll have proven to be passing fads. Perhaps the popularity of certain toys reflects their success in delivering their messages to a changing audience, or the persistence of the values that they seem to represent.

The exhibition *Barbie, Teddy, and Jack: Classic Toys of Yesterday,* on view at the Museum of Natural History through March 7, contains nearly 200 vintage toys from the collection of the Toy Loan Program of Los Angeles County's Department of Public Social Services. The items on display mirror the enthusiasms of the last 65 years, during which they were manufactured: Cecil, the seasick puppet star of an early television program for kids, was rendered as a "serpent"-in-a-box by Mattel, in a 1961 adaptation of new themes to old technologies (a prototype jack-in-the-box was produced in 1750). A spaceman robot toy from 1961 reflects the promotions surrounding NASA's explorations. A 1970 Talking G.I. Joe Astronaut "with life like hair" embodies several messages about then-current ideals.

DICK MEIER

THE TOY LOAN PROGRAM was begun during the Depression, as the result of a petty theft. In 1934, the manager of a local dime store caught two boys shoplifting toys; in the subsequent investigation, authorities learned that the children had no previous records but had been tempted into crime by items that their parents were unable to purchase for them. Civic leaders were inspired by reports of the incident to address what they perceived as a widespread problem, and a loan program was founded to make donated toys available, initially under the sponsorship of the Works Project Administration. When this Federal program was terminated in 1942, the Los Angeles County Board of Supervisors assumed responsibility for continuing toy loans, at first through the Probation Department and then, since 1965, through Social Services.

Under the Toy Loan Program, children may borrow toys for a short time, with no membership fees or fines for damages or late returns; the only requirement for participation is that an application card be signed by a parent or other responsible adult. After a child has made and returned twenty loans, he or she is allowed to select and keep a toy from a special collection, the Honor Cupboard. Operating through parks, recreation centers, libraries, housing projects, and at least one homeless shelter, the loan program serves approximately 15,000 children each year.

Both new and used toys, games, and books are donated to Toy Loan by individuals and toy companies and other corporations, and toy drives conducted annually through institutions such as the Natural History Museum contribute to the inventory. Volunteers at the various outlets sort the gifts, cleaning and repairing them if necessary and sometimes reconstructing an item using parts salvaged from other toys or obtained from the manufacturer. After used toys are completely restored, they are put on shelves alongside those that are new, and all are offered for loan.

THE CONDITION of the toys in *Barbie, Teddy, and Jack,* which includes some of the oldest from the Toy Loan Program collection, is astounding, considering that they each had not one but perhaps dozens of "owners." The pasteboard eaves of a wooden 1920s Schoenhut doll house are a little bent on the corners, but the miniature bungalow still has its lace curtains and felt window-box flowers and a real screen door. Although a blue metal Structo steam shovel from the same era has lost the cable that hoisted its dipper bucket, it still swings its boom and rolls along on its tank-style rubber track shoes. Small repairs have been made through the years by the conscientious volunteers for the program. But these antique toys, most now retired from service, have obviously been cherished—over and over again.

Artifacts from the Toy Loan Program's archive were selected for exhibition at the museum by Beth Werling, Collections Manager for History, who relied in part on knowledge she has gained from study of the museum's own collections of more than 4,000 dolls and children's playthings dating back as far as the eighteenth century.

Barbie and Cabbage Patch Kids are registered trademarks of Mattel, Inc. G.I. Joe is a registered trademark of Hasbro, Inc.

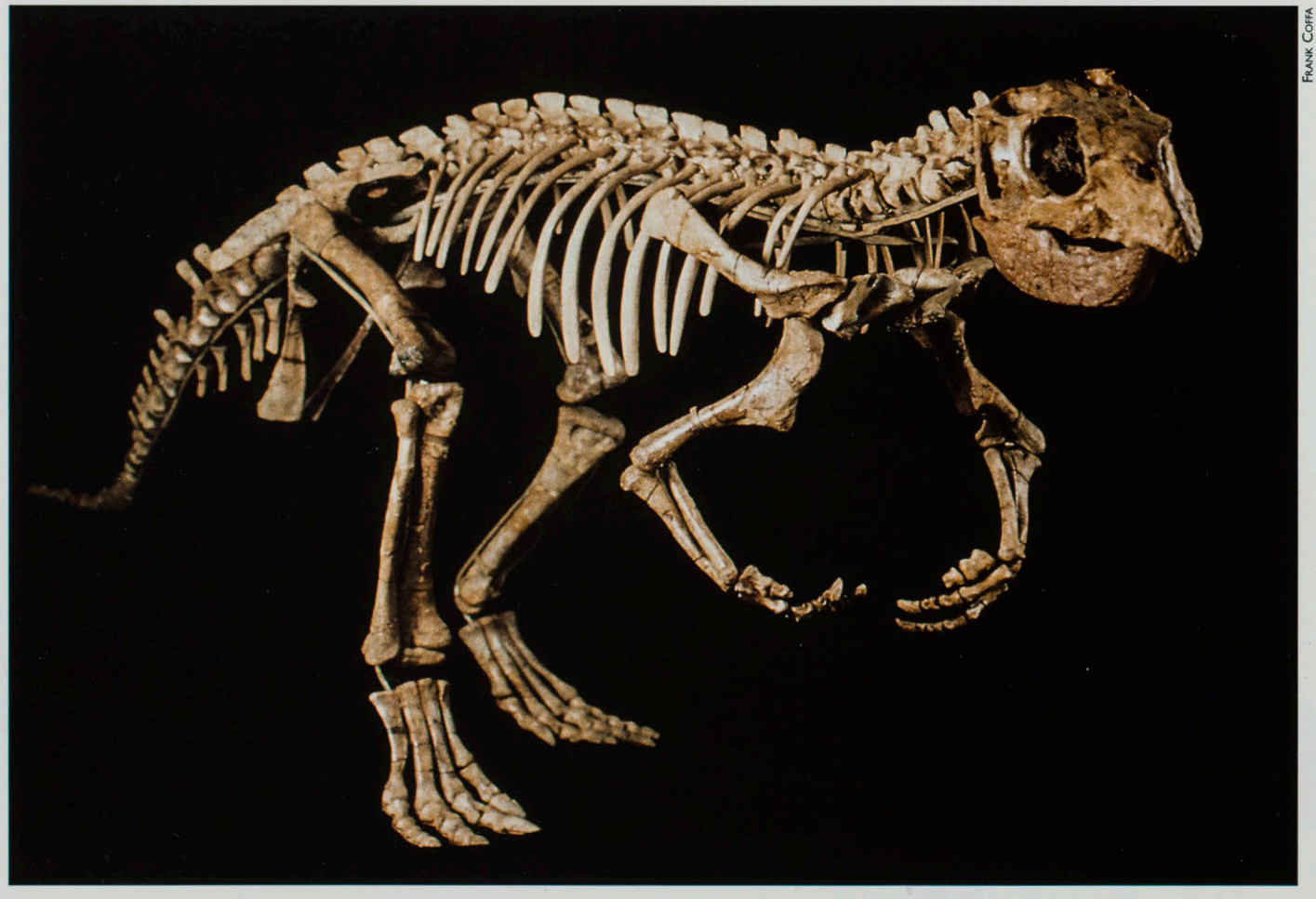
GREAT RUSSIAN FOSSILS

THE SHEEP-SIZED *Protoceratops andrewsi,* with its parrot-beaked snout and imposing neck frill, is one of the best known of dinosaurs: literally hundreds of individuals have been collected in central Asia, and the species sometimes makes up more than 80 percent of all the dinosaurs unearthed from a particular fossil site. The herbivore seems to have lived in large groups, perhaps forming nesting colonies along the shores of ancient lakes and streams that lay in an otherwise arid landscape. California residents know of the catastrophes that can occur in such an environment—flash floods, sand storms, and extended droughts, coupled with this particular dinosaur's natural instinct to congregate, may explain its unusual abundance in the fossil record.

Eggs, a hatchling, and an adult skeleton of *Protoceratops andrewsi,* from Late Cretaceous Period formations in the Gobi Desert of Mongolia, are part of *The Great Russian Dinosaurs,* an exhibition of 120 dinosaurs and other prehistoric forms on tour from Moscow's Paleontological Institute and Museum and on view in the Exposition Park museum through May 2. The exhibition follows the development of land animals through much of their history from about 290 million years ago in the Permian Period until the extinction of the dinosaurs and the beginning of the Age of Mammals around 65 million years ago. Over this time, the climates of the world changed dramatically, from relatively arid to humid and mild and then back to cooler conditions again. The assemblages of vertebrates on land responded to these global variations, and the exhibition provides an overview of the variety of forms that arose and evolved only to eventually disappear.

The Great Russian Dinosaurs, one of the largest dinosaur exhibitions ever sent on world tour, was organized by the Russian Paleontological Institute, working with the Monash Science Centre and the Queen Victoria Museum in Australia,

***Psittacosaurus mongoliensis,* a herbivore whose remains are very common in collections from Mongolian formations dating to the Early Cretaceous, some 110 million years ago. This little dinosaur (adults were about 6 1/2 feet in length) is thought to have been the ancestor of the horned neoceratopsians such as *Triceratops*.**



FRANK COFFA

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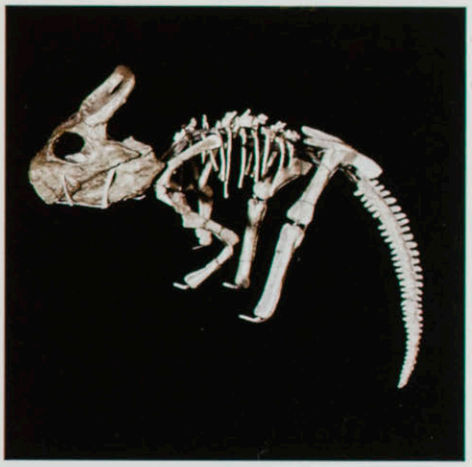


FRANK COFFA

where the exhibition was first presented. The history of the Paleontological Institute goes back to the *kunstkamer,* the extraordinary collection of natural science specimens amassed in the early eighteenth century by Peter the Great. But the Moscow museum's collections also include fossils excavated by scientists of the Russian Academy of Sciences during more than 200 years of paleontological field work as well as treasures uncovered in various international expeditions mounted during the twentieth century. The Australians have cast the institute's finest and rarest specimens for inclusion in the traveling exhibit. In turn, proceeds from the sale of tickets to *The Great Russian Dinosaurs* will underwrite Russian paleontologists' future field research in central Asia and elsewhere.

The exhibition contains dinosaurs that were found in Mongolia and Kazakhstan as well as older vertebrates excavated on the Russian Plain immediately to the west of the Uralskiy Khrebet, the Ural Mountains. The Mongolian finds are most unusual in that they represent "mountain dinosaurs," which were living not near sea level but at altitudes of between 4,000 and 6,500 feet.

FRANK COFFA

Above: **An adult and a newly hatched *Protoceratops andrewsi;* the youngster was about 15 inches long, and the adults reached almost 6 feet in length. Because we have remains of this herbivore in all growth stages (eggs containing embryos, hatchlings, and "teenagers" as well as adults), paleontologists have learned how the skeleton of the dinosaur changed through the life of the individual, something that is quite rare to know about an extinct animal. As in many other land animals, the very young *P. andrewsi* had a head proportionately much larger in relation to its body than it would have as an adult.**

Left: **The tiger-sized *Inostrancevia alexandri,* a saber-toothed reptile that lived in swamps around 245 million years ago. The relatively slender, almost gracile nature of this animal's bones and the fact that it sported several kinds of teeth mark it as an advanced carnivorous mammallike reptile, a therapsid.**

THE RUSSIAN EXHIBITION includes not only dinosaurs but also a number of other four-legged creatures from a group that arose near the end of the Carboniferous Period, about 300 million years ago, and coexisted with dinosaurs and mammals in the Triassic Period that followed; these prehistoric animals have been dubbed mammallike reptiles by paleontologists because of certain features of their skulls, jaws, and teeth. In the Early Triassic, about 250 million years ago, the therapsids—the most advanced of the mammallike reptiles—dominated many terrestrial environments. Then about 220 million years ago disaster struck: a global catastrophe resulted in the extinction of an estimated 75 percent of the earth's species and seriously undermined the therapsids' preeminence. Some 20 million years later, most of the therapsids were extinct, and their demise had created unoccupied ecospace into which the dinosaurs swiftly moved.

Mammals had evolved from the advanced mammallike reptiles in the Triassic Period but were relegated to a minor role in vertebrate communities during the time that the dinosaurs thrived and diversified. The Age of Mammals might have occurred much sooner had it not been for the calamitous Triassic-Jurassic extinction event and its effects on the therapsids, our very distant relatives.

The Great Russian Dinosaurs *was organized by Dr. Patricia Vickers Rich, professor of palaeontology at Monash University in Melbourne, Prof. Alexei Rozanov, director of Moscow's Paleontological Institute and Museum, and Chris Tassell, director of the Queen Victoria Museum in Tasmania, working with a team of Russian and Australian scientists and education and design specialists. Dr. J.D. Stewart, paleontologist for the Natural History Museum, is local curator for the exhibition.*

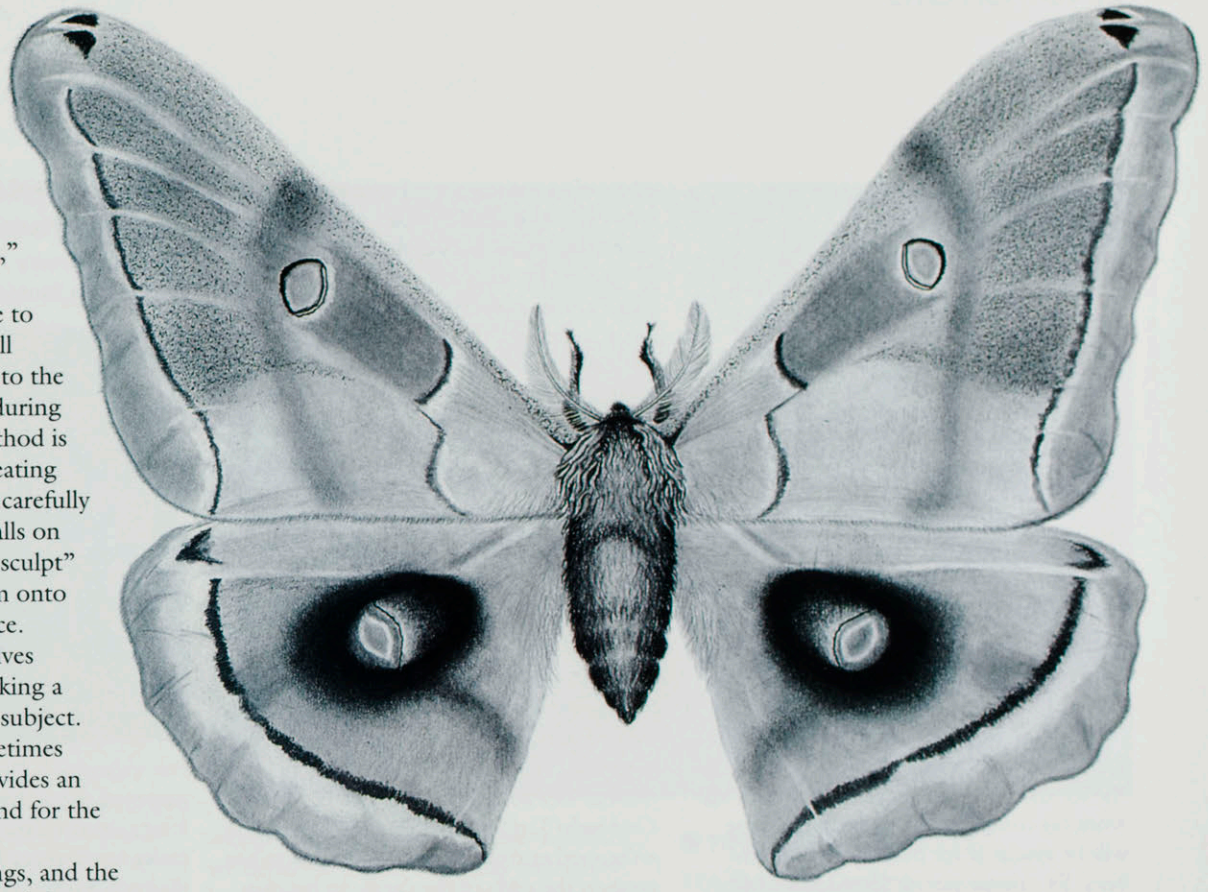
FRANK COFFA

Above: **A skull of *Estemmenosuchus mirabilis*, a rhinoceros-sized therapsid found in abundance on the Russian Plain in formations dating back 250 million years. The horns on this advanced mammallike reptile are reminiscent of those on a modern moose.**

E. KUROCHKIN

Below: **The Paleontological Institute and Museum in Moscow, one of the largest of the world's museums specializing in fossils. The twentieth-century expansion of a collection dating back to the time of Peter the Great necessitated the construction of this building, which opened to the public in the mid-1970s. The exceptional paleontological materials on display are complemented by artists' and sculptors' reconstructions of scenes from the evolution of life.**

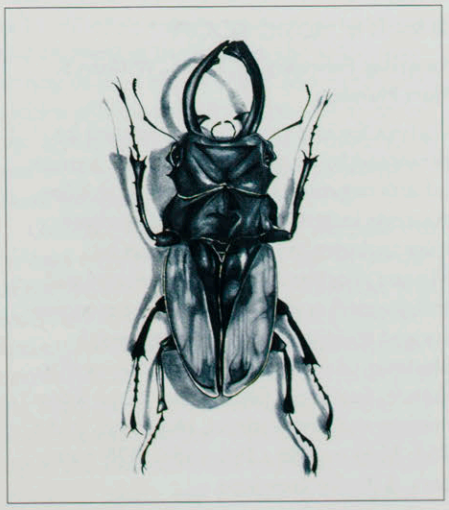
INSECT CHIAROSCURO

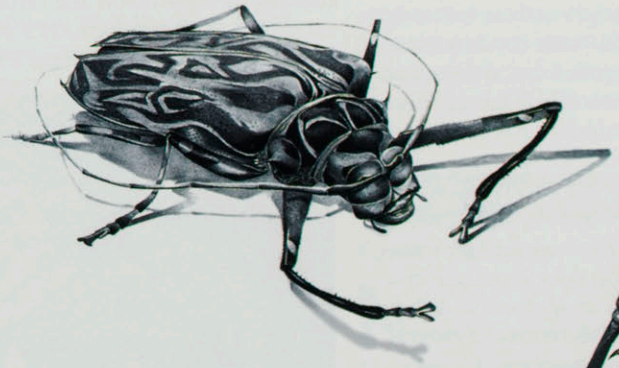


CHIAROSCURO (kē-är´ə skoor´o), an Italian word meaning "light and dark," is the name of a drawing technique that artists use to accurately capture the full range of values available to the human eye. Developed during the Renaissance, the method is extremely effective at creating the illusion of depth: by carefully mapping the way light falls on an object, an artist can "sculpt" a three-dimensional form onto a two-dimensional surface.

Insects lend themselves nicely to the student seeking a challenging chiaroscuro subject. The unfamiliar and sometimes bizarre morphology provides an intriguing proving ground for the developing artist.

Ten charcoal drawings, and the pinned insects that inspired them, are now on view in the Insect Zoo of the Exposition Park museum. The chiaroscurists who created the drawings are students in Jesse Cantley's class on representational drawing at Fullerton College. Mr. Cantley, who has a master's degree in fine arts from USC, is illustrator for the Natural History Museum's Entomology Section; the insect models were borrowed from Entomology's collection.





Two views of the Harlequin beetle, *Acrocinus longimanus*, by Rigoberto Cardenas (*above*, 21 by 15 inches) and Armando Tongko (*right*, 15 by 23 inches). Charcoal on paper.

***Top:* Silk moth, *Antheraca polyphemus*, by Diane Rieger. Charcoal on paper, 24 by 18 inches.**

***Left:* Stag beetle, *Odontolabis curvena*, by Danny Drake. Charcoal on paper, 18 by 24 inches.**

PROGRAMS FOR MEMBERS AND VISITORS

Performance and lecture

■ ASTRAL TRAVELERS

Sunday, January 10, 2 p.m., Jean Delacour Auditorium, Museum of Natural History

Treat yourself to a delightful concert from the past when Luis Perez performs in celebration of the North American release of his most recent work, *Astral Travelers* (Domo Records, 1998). Mr. Perez, an expert in pre-Columbian musical instruments, has collected ancient instruments and artifacts dating back more than 3,000 years. For the past 15 years, he has conducted workshops on Mesoamerican music and the construction of pre-Columbian and classic Mexican instruments. In addition, he has performed and collaborated with Jackson Brown, Andreas Vollenweider, James Horner, and other artists. Mr. Perez will sign copies of *Astral Travelers* after the lecture and performance; copies of the work on compact disk and cassette tape will be available for purchase. $7 members, $9 nonmembers, $5 students with current I.D.

■ AIRBRUSHING WITH LIGHT

Thursday, January 15, 7 to 9 p.m., Connor Pavilion, Petersen Automotive Museum

In a varied photographic career spanning 20 years, Scott Williamson has become a master at capturing the form, design, and essence of the automobile. Through his company, Photodesign, he has illustrated campaigns for Toyota, Lexus, and Mercedes Benz and has photographed some of the world's most beautiful and powerful cars. In this illustrated presentation, Mr. Williamson talks about automotive photography as an art form and about reflected light as his technique of choice. $7 members, $9 nonmembers, $5 students with current I.D.

Lecture and book signing

■ THE PATTERN OF EVOLUTION

Saturday, January 23, 2 p.m., Jean Delacour Auditorium, Museum of Natural History

Are there similarities between the ways the living and nonliving worlds function and evolve? Is there a pattern to the patterns of weather, geology, and evolution? In this lecture, Dr. Niles Eldredge, curator of invertebrate paleontology at the American Museum of Natural History and author of *The Pattern of Evolution* (W.H. Freeman, 1998), explores the relationships among the components of the universe and places the evolutionary process into an ecological context. $7 members, $9 nonmembers, $5 students with current I.D.

Lecture and cooking demonstration

■ EAT A BUG

Sunday, January 31, 2 p.m., Jean Delacour Auditorium, Museum of Natural History

In South Africa, it's mopane worms in a tangy tomato sauce. In the Amazon, the menu might include roasted termites or winged ants. In Bali, a favorite is curried dragonfly. Whatever your preference, David George Gordon, author of *The Eat-a-Bug Cookbook* (Ten Speed Press, 1998), has the arthropod entree for you. Mr. Gordon has gone to the ends of the earth, to his own backyard, and under the refrigerator to find culinary inspiration and information about entomophagy (bug-eating). Now he brings you the results with relish—or a light cream sauce. His presentation includes a cooking demonstration and tasting of the exotic fare. $10 members, $12 nonmembers, $8 students with current I.D.

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■ LUST IN THE DUST

Arthropod Mating Behavior

Sunday, February 14, 2 p.m., Jean Delacour Auditorium, Museum of Natural History

ART EVANS

For Valentine's Day, consider the mating games of the arthropods with Dr. Art Evans, Insect Zoo Director. Males and females rarely meet by accident—how do their enchanted encounters occur? What is the language of the scorpion's dance? And do male black widow spiders have any idea of the meaning of the name we've given them; do they suspect just how dangerous their liaisons might be? Dr. Evans' lusty slide lecture will be followed by a tour of the Insect Zoo, where love is often in the air. $7 members, $9 nonmembers, $5 students with current I.D.

Concert

■ IN THE MUSIC ROOM

Saturday, February 27, 7 p.m., William S. Hart Mansion

Classics for the violin and piano will be presented by In the Music Room, a musical arts organization specializing in salon concerts in intimate venues. The repertoire includes important sonatas by Mozart, Beethoven, and Schumann and enlightened commentary on the composers and their works by pianist Daniel Shulman. A reception follows the performance. Seating is limited; for more information and reservations, please call 213/763-3534 or 805/254-4584. $25 members, $30 nonmembers.

Lecture and book signing

■ THE SEARCH FOR THE GIANT SQUID

Sunday, March 7, 2 p.m., Jean Delacour Auditorium, Natural History Museum

It can grow 60 feet in length, possibly longer, and weigh more than a ton. It is spindle-shaped with eight grasping arms studded with toothed suckers, a huge beak, and two lidless eyes the size of dinner plates. Commonly referred to as the giant squid, *Architeuthys dux* is the least-known large animal on earth. In his book, *The Search for the Giant Squid* (Lyons Press, 1998), Richard Ellis provides the first authoritative study of this elusive ocean creature, an invertebrate that has battled sperm whales, terrified fishermen through history, and intrigued scientists when it has occasionally washed up on shores around the world. A book signing follows the lecture. Until February 26, $6 members, $8 nonmembers, $4 students with current I.D.; after February 26, tickets may be purchased at the door for $7 members, $9 nonmembers, $5 students with current I.D.

ADULT FIELD TRIPS

A birding and natural history tour

■ SPRING IN THE OWENS VALLEY

Friday through Sunday, April 23 to 25

Spend the weekend in a country inn nestled at the foot of the eastern Sierra Nevada and enjoy nature walks, bird watching, and an evening barbecue in the wilderness setting of the Owens Valley. More than 300 species of birds as well as scores of mammal and reptile species visit or live in this region, and we'll tour a variety of habitats where these animals nest and forage.

Ornithologist Andrew Kirk will lead our birding expeditions through the wetlands of the valley's watercourses. Along the way, we'll visit the cliffs of Red Rock Canyon and explore Fossil Falls with museum paleontologist Dr. Dave Whistler. We'll stop at the Maturango Museum and enjoy the High Desert exhibits. Two nights of lodging at the Winnedumah Hotel in Independence, all meals, and roundtrip chartered

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motor coach transportation are included; we depart at 8 a.m. on Friday and return by 8 p.m. on Sunday. $450 members, $465 nonmembers, double occupancy.

ADULT CLASSES

■ WRAP DOLLS

Saturday, February 20, 9:30 a.m. to 12:30 p.m., Education Classroom, Museum of Natural History

Dick Meier

Fashion your own wrap dolls with artist Angela Briggs. We will learn the history behind the wrap doll tradition, and you will festoon your dolls with a variety of embellishments and adornments. And you'll leave the workshop with two dolls of your own and the skills needed to continue this very creative art form at home. $40 members, $45 nonmembers.

■ PINE NEEDLE BASKETS

The Teneriffe Designs

Saturday, February 27, 9 a.m. to 4 p.m., Page Museum at the Tar Pits

Learn the delicate intricacies of the spiderweb Teneriffe designs as you build a coiled pine needle basket. You'll practice several stitches and perfect shaping techniques and patterning. Instructor Judy Mulford, a basketry artist and educator, welcomes students of all skill levels. $50 members, $60 nonmembers.

FAMILY PROGRAMS

Family field trip

■ DIGGING FOR FOSSILS

A Silverado Canyon Adventure

Saturday, March 27, 9:30 a.m. to 12:30 p.m. Children 5 and older, with accompanying adult

Spend the morning excavating for fossils up to 160 million years old with museum paleontologist Dr. J.D. Stewart, the local curator for the exhibition, *The Great Russian Dinosaurs*. Bring your picks and shovels and unearth ancient ammonites, snails, clams, and shark teeth. Dr. Stewart will help us identify our finds and make records

just as museum scientists do. We'll meet at the Orange County site; you may wish to pack a lunch for a picnic following the program. Adult/child pair: $30 members, $40 nonmembers; half off for each additional person.

Another weekend camping trip, with fossil hunting and activities for families with children of all ages, is planned for April 16 to 18. For more information, please call 213/763-3534.

Children's class

■ WRAP WARRIORS AND PRINCESSES

Sunday, January 24, 2 to 3:30 p.m., Education Classroom, Museum of Natural History. Children 6 to 10

Create your very own warrior or princess dolls with artist Angela Briggs, and learn about the children who first made wrap dolls. You will perfect the easy wrapping technique and then decorate your dolls with equipment and finery. At the end of the class, you'll have two dolls to take home. $20 members, $25 nonmembers.

■ DINO-SNORES

Overnight, Friday and Saturday, January 29 and 30 and—for boy scouts only—February 12 and 13, 7 p.m. to 8:30 a.m., Museum of Natural History. Children 5 and older, accompanied by an adult

Sleep in the shadows of *Tyrannosaurus rex* and *Triceratops horridus* on our overnight adventure. We'll tour the Dinosaur Hall and *The Great Russian Dinosaurs* exhibit with museum docents, join museum instructors in a craft project, and listen to stories about ancient reptiles. We will also meet some living relatives of the dinosaurs. $40 members, $50 nonmembers.

For information on the special sleepover for boy scouts on February 12 and 13, please call 213/763-3534.

Classes for preschool children

■ TIDE POOL TREASURES

Saturdays, January 30, 3 year olds (morning) and 4 year olds (afternoon) and February 6, 3 year olds (morning) and 5 year olds (afternoon), Education Classroom, Museum of Natural History

With museum educator Carl Carranza, come and learn how tidepool creatures can survive in their sometimes wet and sometimes dry homes. Morning sessions are from 10 to 11:30 a.m., afternoon sessions are from 12:30 to 2 p.m.; adult/child pair, $20 members, $25 nonmembers.

Children's class

■ DINOSAUR DIGGERS

Saturday, February 27, 10 a.m. to noon, Education Classroom, Museum of Natural History. Children 5 to 7

Step back in time 65 to 265 million years ago to the Age of Reptiles, when dinosaurs roamed the earth. With museum educator Kamaron Sardar, you'll examine real fossil specimens, do some excavating, and create dinosaur crafts to take home. $20 members, $25 nonmembers.

A family field trip

■ SEABIRDS AND MARINE MAMMALS

Sunday, February 28, 7 a.m. to 4 p.m. Children 7 and up, accompanied by an adult

With museum naturalists Dr. John Heyning and Kimball Garrett, we will cruise the San Pedro Channel aboard the Research Vessel *Vantuna*. Sailing near and beyond Santa Catalina Island, we'll search for shearwaters, petrels, jaegers, and other seabirds usually only found far offshore. We will also see gray whales traveling along the coast from their calving lagoons in Baja California to their summer homes in the far north. And we may encounter minke whales, harbor seals, and dolphins. Please bring a bag lunch. $65 members, $75 nonmembers.

Children's class

■ IT'S THE PITS!

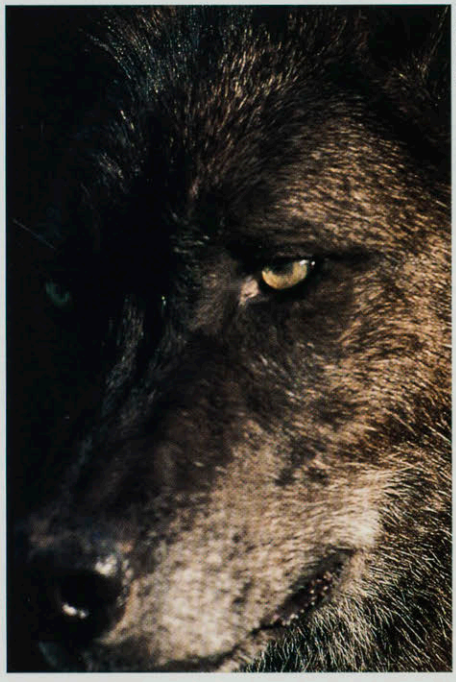
Saturday, March 13, 10 a.m. to noon, Page Museum at the Tar Pits. Children 7 to 9

The tar pits—smelly and gooey! With museum paleontologist Gary Takeuchi, you'll learn how scientists uncover the amazing animals that got stuck there during the Ice Age, thousands of years ago. As you examine real specimens, you'll find out how bones are removed from the hardened asphalt. $20 members, $25 nonmembers.

■ THE WOLF

Real or Imagined?

Saturday, March 20, 10 a.m., Jean Delacour Auditorium, Museum of Natural History. Children 6 and older, accompanied by an adult



BRUCE WEIDE

Meet Koani, a 100-lb gray wolf from Montana, and Indy, her dog companion. Wildlife biologist Patricia Tucker gives you a glimpse into the secret life of North America's most fascinating predator. Then documentary filmmaker Bruce Weide shares stories from myth and folklore that reveal the wolf that stalks human imagination. $5 members, $7 nonmembers, $4 children.

ANNOUNCEMENT

■ VOLUNTEER AT THE TAR PITS

Learn about Los Angeles as it was 40,000 years ago, when saber-toothed cats and mammoths strolled along what is now Wilshire Boulevard! Then use your

FAMILY FUNDAYS

These family programs are free with museum admission for children ages 4 and older. No reservations are necessary, but space in some programs is limited, so please arrive early.

■ FAMILY STORIES

Saturday, January 9, 1:30 p.m., Discovery Center, Museum of Natural History

Hear stories, learn to investigate and trace your family heritage, and make a family storybook to take home.

■ DIGGING UP DINOS!

Saturday, February 13, 1:30 p.m., Discovery Center, Museum of Natural History

Learn how paleontologists prepare fossils, and construct a craft item to take home.

■ CAR SNOW GLOBES

Saturday, January 30, 2 p.m., Artopia, Petersen Museum

Explore density and viscosity as you make a snow globe; bring an empty baby-food-sized jar with lid.

■ CAR-O-SEL

Saturday, February 27, 2 p.m., Artopia, Petersen Museum

Bring an empty round oatmeal box, and learn about potential and kinetic energy while creating a merry-go-round.

insider's knowledge to enrich others' experiences at the Page Museum at the Tar Pits.

The Page Museum is now accepting applications for its February volunteer training program, a fascinating course on the world-famous asphalt deposits and the last great Ice Age. Graduates of the program give guided tours and gallery talks to school children and adults and welcome visitors to the museum at the information desk. No prior science background is needed, just flexibility, a sense of humor, and a love of learning. For information and an application, please leave a message for Eileen Wallis, Page Volunteer Coordinator, at 323/857-6305.

■ HAPPY BIRTHDAY TO YOU!

Celebrate a special day in a special way: Birthday parties for children ages 5 to 10 may be held at the Museum of Natural History, the Petersen Automotive Museum, and the Page Museum at the Tar Pits. All parties are 2 hours long, and one price include an activity and guided exhibit walk; we also provide the cake, ice cream, goody bags, invitations, parking passes, decorations, all of the planning, and the cleaning up afterward! For more information, please call 213/763-3239.

PUBLIC PROGRAMS RESERVATION FORM

■ **By telephone:** Use your MasterCard or VISA. Call the Education Division at 213/763-3534, weekdays, 8 a.m. to 4 p.m. Credit cards are accepted only with a minimum charge of $20.

■ **By mail:** Complete the form below, fill in the charge information or enclose a check payable to Museum Foundation, and return your order form and payment with a self-addressed, stamped envelope. The form may be duplicated. Mail to: ***Education Division, Natural History Museum, 900 Exposition Boulevard, Los Angeles, CA 90007***

■ **Important: Reservation, Waiting List and Refund Policies.** Preregistration is required for all classes, workshops, and field trips and is recommended for all other Education Division programs. Tickets to auditorium events may be purchased at the door on a first-come, first-served basis; seating is not reserved. Reservations are not necessary for Family Fundays. Applicants for filled programs will be placed on a waiting list and contacted if vacancies or rescheduling occur. If you have paid for a filled program, your payment will be refunded in 4-6 weeks.

Cancellations must be made at least 6 business days prior to the first day of an event for the registrant to be eligible for a partial refund. No refunds can be given for cancellations made in the 5 days before the event.

Dates and times of programs are subject to change, and class sizes are limited. Please call 213/763-3534 weekdays between 8 a.m. and 4 p.m. to verify program dates, times, and availability.

■ **Special Assistance Available.** If you wish to attend a museum event and require auxiliary aids or services, please contact the museums' Americans with Disabilities Act (ADA) Compliance Officer at least three (3) business days prior to the event. The ADA Compliance Officer may be reached by telephoning 213/763-3417 (voice) or by calling that number via California Relay Service at 800/735-2929 (TTY).

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Los Angeles, CA 90007

Program	Number of participants	Price	Total Price

❑ My check is enclosed

❑ Charge my credit card:
- ❑ MasterCard
- ❑ VISA

Total Remittance _____

Credit Card # _____ Expiration Date _____

Signature _____

Please list children's names, ages, and programs in which they are enrolling:

_____

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As of December 1, 1998

MUSEUM ON THE MOVE

NEW ACQUISITIONS

Dr. Jay Savage, a professor of biology at the University of Miami who has had a long association with the Natural History Museum, recently donated approximately 30,000 amphibian and reptile specimens to the museum. Most of the new acquisitions were collected through the Organization for Tropical Studies in Costa Rica, but other countries in Latin America are also represented; the collection includes the ill-fated Golden Toad and many other species that are now extinct as well as a number of species yet to be named and described. The new material brings the total number of specimens in the museum's Herpetology collections to roughly 180,000.

A large collection of marine bottom-dwelling invertebrates, including polychaete worms, crustaceans, molluscs, and echinoderms, has been donated to the Natural History Museum by the Washington State Department of Ecology and the Friday Harbor Laboratories of the University of Washington. The specimens were collected from the relatively shallow estuarine waters of the Straits of Juan de Fuca and Georgia during a study undertaken in the 1970s to provide baseline population information in case of an oil spill. The size and scope of the collection will make it extremely useful in museum-based research on population variation, life history development, biodiversity, and systematics. Initial examinations by the museum's curatorial staff have already revealed that hidden among the material identified at the time of the survey are dozens of undescribed species, particularly among the polychaetes and crustaceans.

DEPUTY DIRECTOR RETIRES

Dr. Robert J. Lavenberg concluded a distinguished 35-year career with the Natural History Museum when he retired from his position as Deputy Director for Research and Collections in December 1998.

When he joined the museum staff as Assistant Curator of Ichthyology in 1963, Dr. Lavenberg, a native of Los Angeles County, was completing his master's degree at the University of Southern California, studying the midwater fishes of the

1966. Mike Hatchimonji

San Pedro Basin. By the time he received his Ph.D. in biology from USC in 1974, he was full curator at the museum, assistant professor at the university, and engaged in an extensive program of research on the fishes of Central and South America and the Galapagos Archipelago.

Dr. Lavenberg was instrumental in a number of improvements in the museum's facilities and collections. He is largely responsible for a vital expansion of the ichthyology holdings, which have grown from 25,000 specimens in the late 1950s to more than 7 million examples today. He has also been extremely active in obtaining funding for research and collections care. As the author of two National Science Foundation grants, he supervised the renovation of the museum's Ichthyology and Herpetology headquarters and the computerization of the collections there. With support from Southern California Edison, he has been the director of a major long-term study of the fishes and environmental conditions of southern California's coastal waters.

Throughout his museum career, Dr. Lavenberg has worked with young scientists. He has served as advisor or doctoral committee member for almost two dozen graduate students and has influenced many other future biologists through lectures, courses, and educational field programs.

"Bob is almost charismatic when he is talking about marine biology," said fellow ichthyologist Dr. Daniel M. Cohen, Deputy Director Emeritus for the museum and a friend of Dr. Lavenberg's since the latter's days in graduate school. "He is an excellent spokesperson for the museum and

a persuasive and successful fundraiser. And his enthusiasm for fishes and scientific research continues to be inspirational to a great number of people."

MEMBERS AND DONORS

■ TAX DEDUCTIBILITY OF MEMBERSHIP DUES

When filing your 1998 income tax return, remember that portions of your museum membership dues are tax deductible. For further information, please contact your tax advisor.

Member Level	Tax Deductible Amount
Active, $40	$40
Educator, $40	$40
Family, $50	$50
Contributing, $100	$90
Patron, $150	$105
Naturalist, $250	$205
Explorer, $500	$430

■ MEMBERSHIP SERVICES ON LINE

Now you can update your address, give us your new telephone number, or send us comments or questions directly over the Internet. Contact the Membership Services Office at our new e-mail address, members@nhm.org.

■ JOIN THE FELLOWS

Are you looking for ways to get more involved with the Natural History Museum? Consider joining the Fellows. Enjoy the company of others in this distinguished group at special events held in conjunction with museum exhibitions and in the homes of private collectors. As a Fellow, you help sustain the vitality of the museum, infusing it with energy and ideas. Your annual gift of $1,000 or more will help enrich the lives of 1 million visitors each year and enhance education programs for 250,000 children. For more information, please call 213/763-3316.

■ 1999 DINOSAUR BALL

Save the date! The museum once again hosts one of Los Angeles's most eagerly anticipated social events. The annual black-tie fundraising gala will be held on Saturday, May 1; for more information please call 213/763-3316.

TRAVEL OUT OF THE ORDINARY . . .

Get off the beaten paths, and discover worlds apart!

The Natural History Museum has an exciting program of travel, with an array of unusual destinations and customized itineraries specifically tailored to our sophisticated Museum Members.

Each of our plans features an asset that only we can offer—you are accompanied on your trip by one of the museum's own experts, carefully chosen to add knowledgeable perspective and uncommon dimensions to your experience.

Contact our travel office today, and take the first steps toward an extraordinary adventure with the Natural History Museum.

An archaeologist's view of China: Beijing, Shanghai, Xian, and Inner Mongolia with Dr. Adam Kessler, May 10 to 27, from $6,495* including airfare to and from Los Angeles. A Yangtze River cruise extension is available.

Curator's choices:

The best of the rapids: Rafting adventure in the Grand Canyon, May 15 to 21, from $1,947*

Wildflowers and pupfish! Springtime in Death Valley and the Eastern Sierra Nevada, April 16 to 19, from $697*

The gems and minerals of Brazil: A collector's odyssey, June 29 to July 12, from $3,000 including airfare to and from Los Angeles

A cruise of the Greek Isles and a total solar eclipse from the middle of the Black Sea, August 4 to 18, from $3,975 to $10,375*

To receive a detailed brochure on 1999 museum travel opportunities or obtain more information about a specific destination mentioned here, please call Christine Robison at 213/763-3350. Or visit our Web page at www.nhm.org/travel.

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*Price per person, all accommodations and land transport included.

The Natural History Museum exists to advance knowledge and to enable people of all ages, backgrounds, and interests to understand and appreciate their natural and cultural heritage. The museum assembles, conserves, interprets, and holds in trust collections of irreplaceable objects from nature and human history. These collections reveal the history of the Earth and the evolution and diversity of life and culture. They sustain programs of research, exhibits, education, and publication.

Natural History Museum of Los Angeles County
World Wide Web: http://www.nhm.org

■ Museum of Natural History, Exposition Park
900 Exposition Blvd., Los Angeles 90007
General information 213/763-DINO

■ Page Museum at the La Brea Tar Pits
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General information 323/934-PAGE

■ Petersen Automotive Museum
6060 Wilshire Blvd., at Fairfax, Los Angeles 90036
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■ William S. Hart Museum
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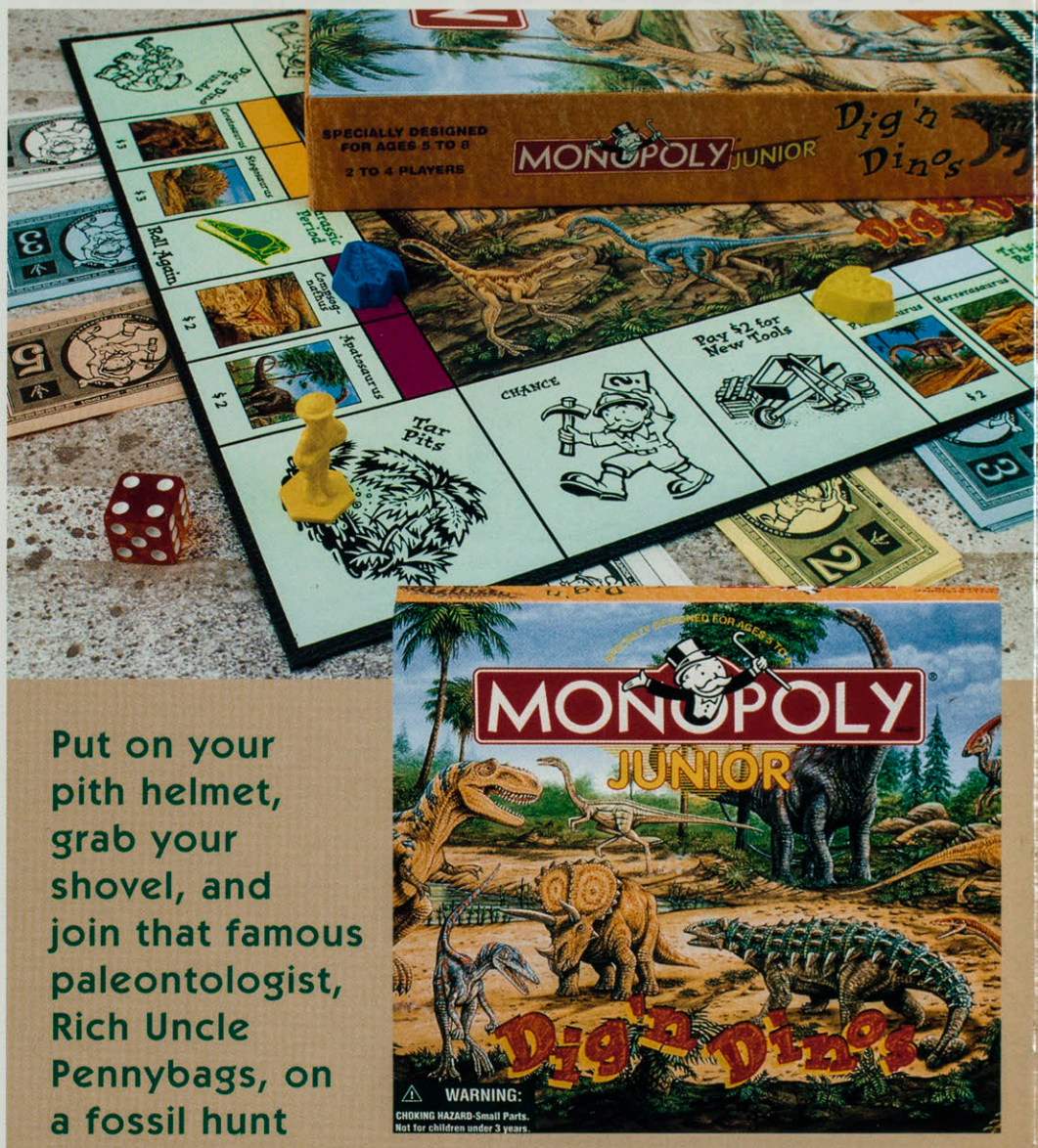
PREHISTORIC MONOPOLY



Put on your pith helmet, grab your shovel, and join that famous paleontologist, Rich Uncle Pennybags, on a fossil hunt deep in the Jurassic Jungle! This special edition of Monopoly Junior teaches you about the dinosaur giants that once ruled the earth and the hazards of searching for them.

Colorful, exciting, and factual, Dig'n Dinos is an educational adventure for children ages 5 to 8. $25.

Natural History Museum Members receive special discounts in all of our stores!

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